RECEIVED
JUL 25 1996
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

James B. Hatfield, PE
Benjamin F. Dawson III, PE
Thomas M. Eckels, PE

Paul W. Leonard, PE
L.S. Christiane Enslow
Stephen S. Lockwood, PE

Hatfield & Dawson
Consulting Electrical Engineers
4226 Sixth Ave. N.W.
Seattle, Washington 98107

Telephone
(206) 783-9151
Facsimile
(206) 789-9834

Maury L. Hatfield, PE
Consultant
Box 1326
Alice Springs, NT 5950
Australia

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Amendment of Parts 73 of the	)	
Commission's Rules to More	)	
Effectively Resolve Broadcast	)	MM Docket No. 96-62
Blanketing Interference,	)	
Including Interference to	)	
Consumer Electronics and Other	)	
Communications Devices	)	

DOCKET FILE COPY ORIGINAL

Reply Comments of Hatfield & Dawson
Consulting Engineers, Inc.

We support the Comments of the Association of Federal Communications Consulting Engineers (AFCCE) with the following additional considerations:

§73.1630 Blanketing interference.
(a) Calculation of the Blanketing Interference Contour for **AM** stations.

This proposed amendment to the Rules stipulates the use of the Cosine Law for calculation of the distance to the 1 Volt per meter AM blanketing contour. While this technique accurately accounts for the fact that the path lengths from the radiators to the point on the contour may not be parallel lines other techniques may provide a more complete depiction of the near field environment.

Computation of the electric and magnetic fields near an antenna can be made using moment method computer programs. Such computations show, for example, that the location of the AM

No. of Copies rec'd 0+6
List A B C D E

blanketing contour as measured by field intensity meters commonly used for AM antenna field measurements can be substantially in error.

The basic reason for this is that the field indicated by the meter face, in electric field units, is derived from the magnetic field component of the far field radiation of the antenna. In the near field the relationship between the magnetic and electric field components of electromagnetic radiation are not the same as they are in the far field where there is a plane wave and the electric to magnetic field ratio is 377. This can lead to errors in measurement when these meters are used. We calculated the near magnetic and electric fields for a specific three tower array and found measurement errors of 150% in the vicinity of the 1 Volt per meter AM blanketing contour (See Appendix for example.).

For this reason more sophisticated computational techniques should be allowed for determining the AM blanketing contour. Properly made electric field measurements should also be allowed for the determination of the AM blanketing contour since similar measurements are allowed by the Commission for the determination of NIER exposure.

(b) Calculation of the Blanketing Interference Contour for **FM** and **TV** Stations.

We wish to emphasize our support for the AFCCE comments regarding the blanketing contour computations for TV stations. Any realistic blanketing contour computations must be based upon the average RMS ERP of the TV station and the vertical pattern of the transmitting antenna.

Respectfully submitted,

Hatfield & Dawson Consulting Engineers, Inc.

Benjamin F. Dawson III, P.E.
President

James B. Hatfield, P.E.
Secretary

July 24, 1996

APPENDIX

TO

HATFIELD & DAWSON

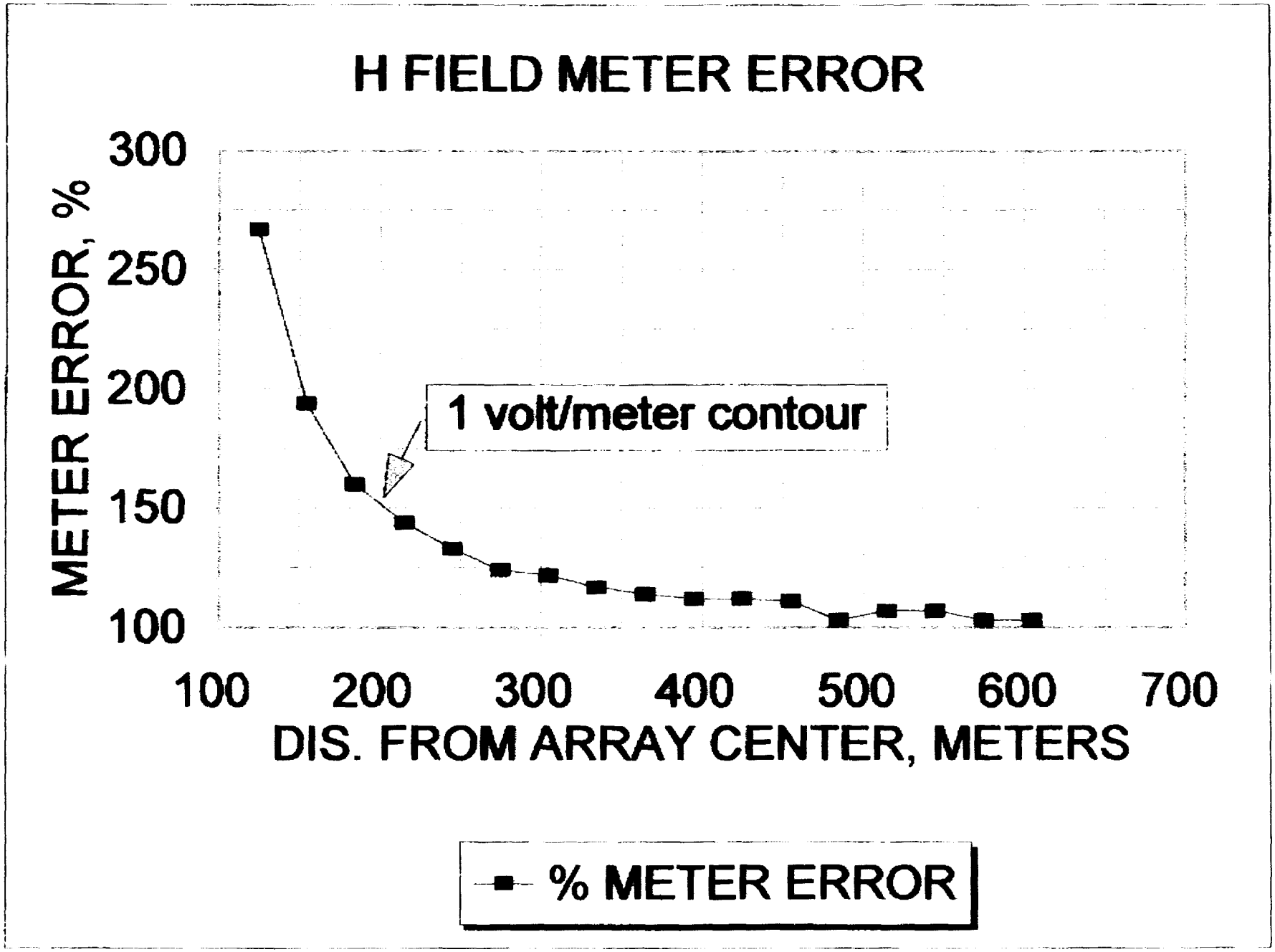
REPLY COMMENTS

ON BLANKETING CONTOUR

RULEMAKING

THREE TOWER EXAMPLE

SHOWING NEAR FIELD MEASUREMENT PROBLEMS



JUL 24 '96 15:04 HATFIELD & DAWSON SEATTLE WA

C:\MBPRO\BLANKET 06-13-1996 12:59:49

NEAR FIELD BLANKETING CONTOUR WITH PROXIMITY EFFECT

GEOMETRY
Wire coordinates in degrees; other dimensions in meters
Environment: PERFECT GROUND

wire	caps	Distance	Angle	Z	radius	segs
1	none	0	0	0	.2	60
		0	0	90.		
2	none	90.	0	0	.2	60
		90.	0	90.		
3	none	180.	0	0	.2	60
		180.	0	90.		

Number of wires = 3
current nodes = 180

	minimum		maximum	
Individual wires	wire	value	wire	value
segment length	1	1.5	1	1.5
radius	1	.2	1	.2

ELECTRICAL DESCRIPTION
Frequencies (KHz)

	frequency		no. of	segment length (wavelengths)	
no.	lowest	step	steps	minimum	maximum
1	1000.	0	1	.004166667	.004166667

Sources

source	node	sector	magnitude	phase	type
1	1	1	2266.393	48.27	voltage
2	61	1	1855.963	122.63	voltage
3	121	1	321.1064	170.52	voltage

C:\MBPRO\BLANKET 06-13-1996 12:59:50

IMPEDANCE

frequency (KHz)	resistance (ohms)	reactance (ohms)	impedance (ohms)	phase (deg)	VSWR
source = 1					
1000.	101.5033	82.61226	130.8729	39.14	3.59
source = 2					
1000.	42.83718	22.79151	47.90400	28.36	1.68
source = 3					
1000.	15.50469	-3.094542	15.81049	348.71	3.24

C:\MBPRO\BLANKET 06-13-1996 12:59:51
CURRENT - RMS

Frequency = 1000 KHz
Input power = 50000. watts

KXXX ANYTOWN CA US *
1000 KHZ FILE DATE 042188 MULTITECH DATE 061396
BLANKETING COV FILE NO. 1234 CLASS N LAT 34 23 19 W LONG 117 23 29
SIGNALS: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2 G G G G G G
CURVES REQUESTED: 2 MODE: DA2 SCHEDULE: U CODE: N TIME OF OPERATION: N
NIGHT: POWER: 50.00 KW 3 TOWERS RADIATION * .00 MV/M AT .00 DEGREES TRUE RMS: .00 MV/M Q: .00 MV/M
0 AUGMENTATION(S) DATE: STATUS: REFERENCE AZIMUTH IS .00

INPUT PARAMETERS:

FIELD RATIO	PHASING	SPACING	ORIENT	TOW REF SWITCH	HEIGHT	ADJ SPACING	ADJ ORIENT	TL/SEC	A	B	C	D	Z SUB 0
1.0000	.000	.000	.000	0	90.0	.000	.000	0	.00	.00	.00	.00	.00
2.0000	-270.000	90.000	.000	0	90.0	90.000	.000	0	.00	.00	.00	.00	.00
1.0000	180.000	180.000	.000	0	90.0	180.000	.000	0	.00	.00	.00	.00	.00

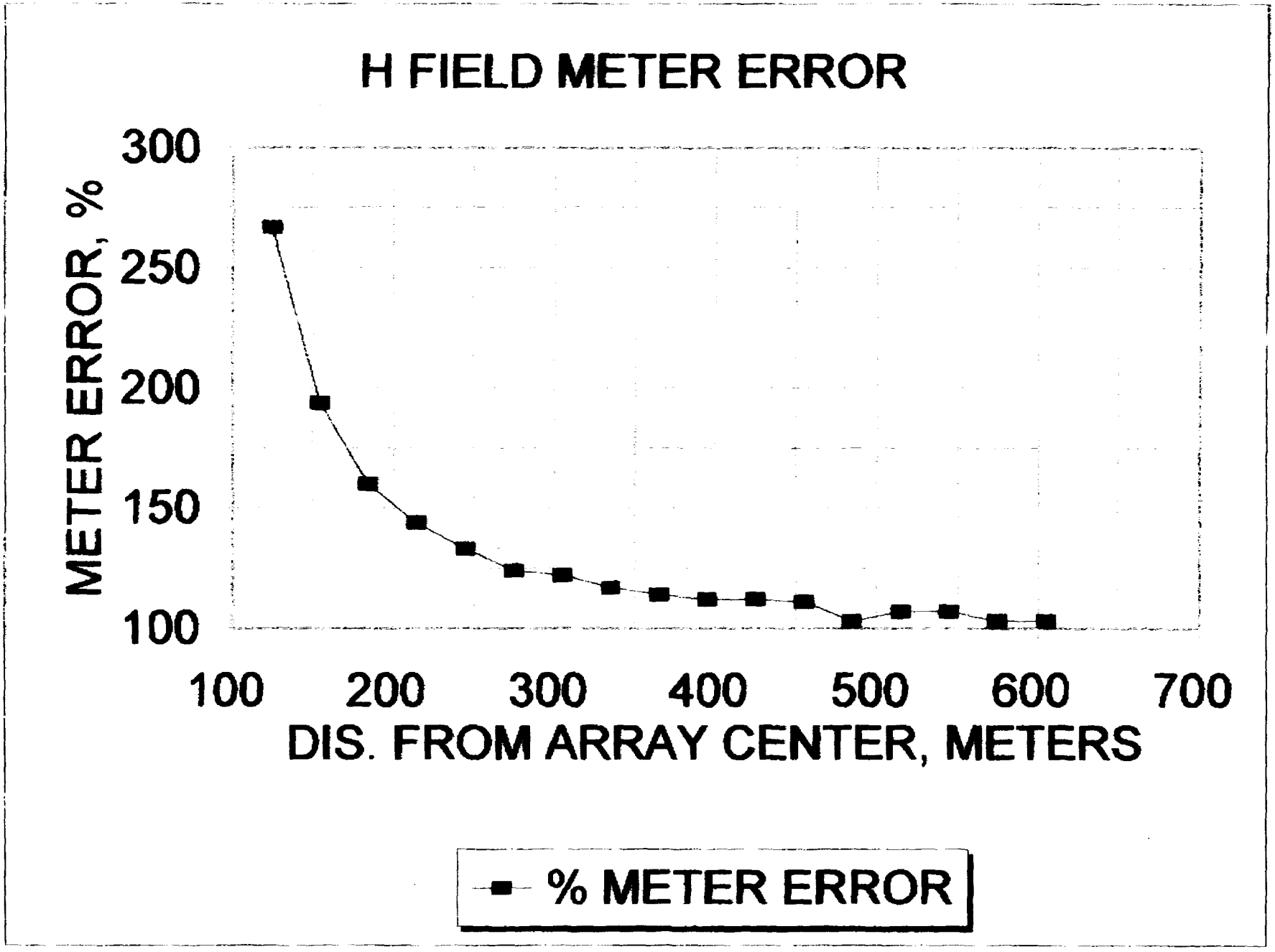
F OF THETA FOR TOWERS

ELEV	1
.0	1.0000
5.0	.9944
10.0	.9779
15.0	.9509
20.0	.9143
25.0	.8691
30.0	.8165
35.0	.7579
40.0	.6946
45.0	.6279
50.0	.5589
55.0	.4886
60.0	.4178
65.0	.3470
70.0	.2766
75.0	.2067
80.0	.1374
85.0	.0686

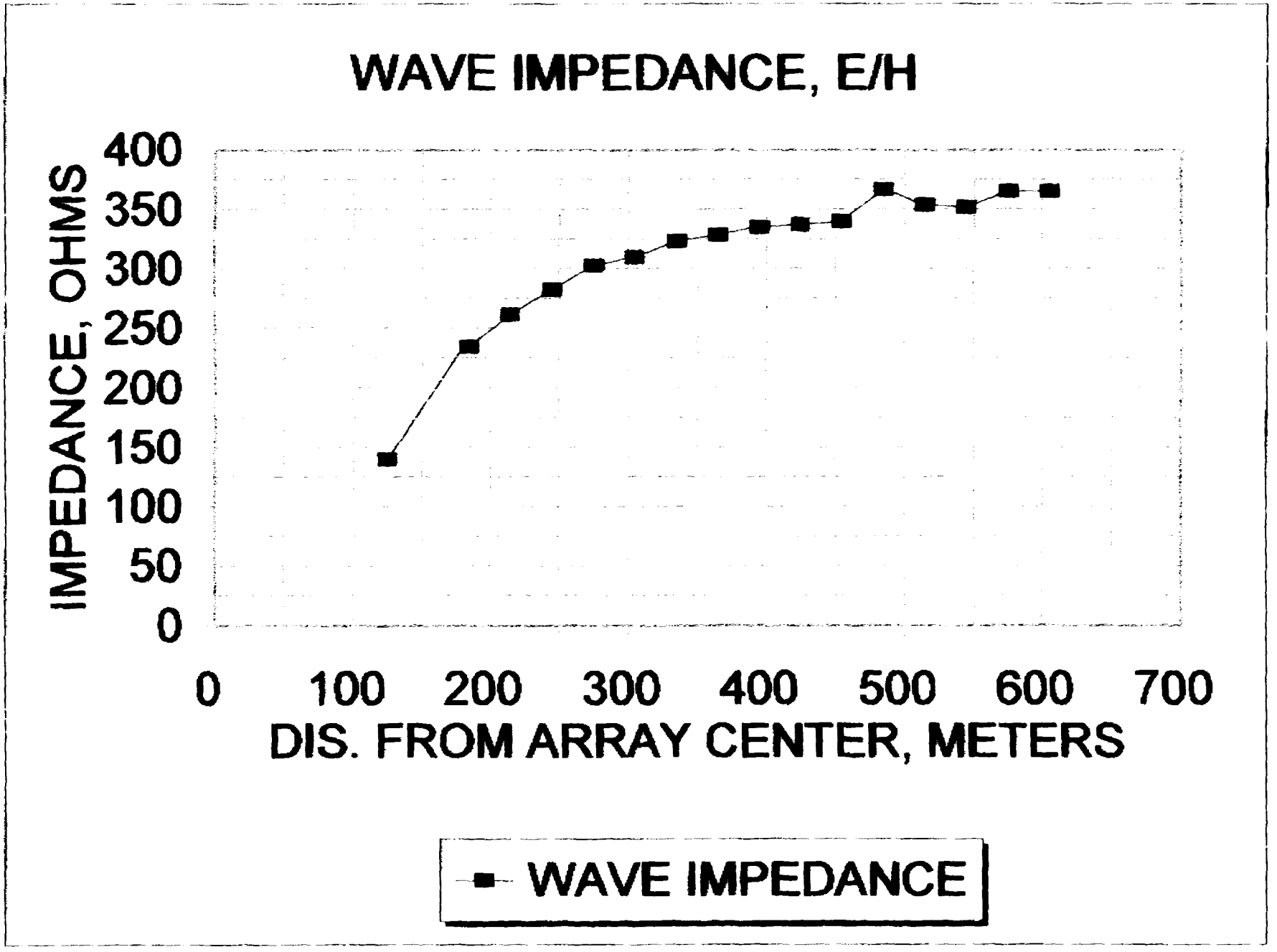
S P A C I N G S

TOWERS	1	2	3
1	.0000	90.0000	180.0000
2	90.0000	.0000	90.0000
3	180.0000	90.0000	.0000

ELEV	RMS (SMALL)
.0	2.5707
2.0	2.5682
4.0	2.5607
6.0	2.5482
8.0	2.5308
10.0	2.5085
12.0	2.4815
14.0	2.4498
16.0	2.4137
18.0	2.3732
20.0	2.3285
22.0	2.2799
24.0	2.2275
26.0	2.1715
28.0	2.1122
30.0	2.0499
32.0	1.9847
34.0	1.9171
36.0	1.8472
38.0	1.7753
40.0	1.7018
42.0	1.6269
44.0	1.5509
46.0	1.4742
48.0	1.3970



JUL 24 '96 15:05 HATFIELD & DAWSON SEATTLE WA



JUL 24 '96 15:05 HATFIELD & DAWSON SEATTLE WA